

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
Before the Board of Patent Appeals and Interferences

In re Patent Application of

FISHER et al.

Serial No. 09/623,681

Filed: September 7, 2000



Atty. Dkt. 540-231  
C#/M#

Group Art Unit: 3726

Examiner: David Bryant

Date: November 27, 2002

Title: MANUFACTURING AND ASSEMBLY OF STRUCTURES

Assistant Commissioner for Patents  
Washington, DC 20231

Sir:

**NOTICE OF APPEAL**

Applicant hereby appeals to the Board of Appeals from the decision dated  
of the Examiner twice/finally

rejecting claims	(\$ 320.00 )	\$	0.00
<input checked="" type="checkbox"/> An appeal <b>BRIEF</b> is attached in triplicate in the pending appeal of the above-identified application (\$ 320.00)		\$	320.00
<input type="checkbox"/> An <b>ORAL HEARING</b> is requested under Rule 194 (\$ 280.00) (due within two months after Examiner's Answer)		\$	0.00
<input type="checkbox"/> Credit for fees paid in prior appeal without decision on merits		-\$ (	0.00)
<input type="checkbox"/> A reply brief is attached in triplicate under Rule 193(b)			(no fee)
<input type="checkbox"/> Petition is hereby made to extend the current due date so as to cover the filing date of this paper and attachment(s) (\$110.00/1 month; \$400.00/2 months; \$920.00/3 months; \$1440.00/4 months)		\$	0.00
		<b>SUBTOTAL</b>	\$ 320.00
<input type="checkbox"/> Applicant claims "Small entity" status; enter 1/2 of subtotal and subtract <input type="checkbox"/> "Small entity" statement attached.		-\$(	0.00)
		<b>SUBTOTAL</b>	\$ 320.00
Less month extension previously paid on		-\$(	0.00)
		<b>TOTAL FEE ENCLOSED</b>	\$ 320.00

Any future submission requiring an extension of time is hereby stated to include a petition for such time extension. The Commissioner is hereby authorized to charge any deficiency, or credit overpayment, in the fee(s) filed, or asserted to be filed, or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to our **Account No. 14-1140**. A duplicate copy of this sheet is attached.

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In re Patent Application of

**FISHER et al**

Serial No. 09/623,681

Filed: September 7, 2000

For: **MANUFACTURING AND ASSEMBLY OF  
STRUCTURES**



Atty. Ref.: 540-231

Group: 3726

Examiner: David Bryant

#10  
Appeal  
David  
N. Bryant  
12/9/02

**APPEAL BRIEF**

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On Appeal From Group Art Unit 3726

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Serial No. 09/623,681



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### I. REAL PARTY IN INTEREST

The real parties in interest in the above-identified appeal are BAE SYSTEMS plc and Advanced Composites Group Ltd by virtue of the Assignment from the inventors to BAE SYSTEMS plc and Advanced Composites Group Ltd recorded September 7, 2000, at Reel 11094, Frame 0796.

### II. RELATED APPEALS AND INTERFERENCES

There are believed to be no related appeals or interferences with respect to the present application and appeal.

### III. STATUS OF CLAIMS

Claims 1-6 and 8-12 stand rejected in the outstanding Final Rejection. The Examiner contends claims 1-6 and 8-12 are either anticipated or obvious in view of the cited prior art.

### IV. STATUS OF AMENDMENTS

No further response has been submitted with respect to the Final Official Action in this application.

### V. SUMMARY OF THE INVENTION

The present invention relates to a method of assembling a structure wherein a precise interrelationship between elements of the structure is required.

Known prior art methods of assembly involve coating a sub-structure with a liquid adhesive material which is then cured on the sub-structure and then machined. The outer layer is then assembled to the sub-structure. This conventional method has a number of disadvantages. First, the adhesive is a viscous liquid which must be applied by hand requiring highly trained individuals so as to be evenly distributed with the desired thickness and without air bubbles. Special tooling must be manufactured for each area to be paneled to prevent the liquid adhesive from spreading to undesirable areas. This tooling must be coated with a release agent to prevent adhesion to the sub-structure and then requires substantial cleaning afterwards. This repeated exposure of the tooling to the coating and cleaning process causes it to deteriorate rapidly after a low number of uses, thereby requiring time and expense to replace the tooling. Additionally, the hand assembled manner of the process requires substantial expertise, training and individual application.

Appellants have found a method of structure assembly which avoids the disadvantages of the above-discussed method. Appellants found that positioning a shim material which is comprised of either a film or sheet of preformed shim material on the sub-structure can be easily accomplished without special tooling or training. The shim material is then cured in place on the sub-structure before any outer layer assembly. The third step is that the cured shim material is machined to

the desired thickness and only then is the fourth step of assembling the outer layer on the sub-structure accomplished.

Thus, the present invention is characterized by a sequence of four steps, i.e., (1) **"positioning the shim material on at least part of the sub-structure, said shim material comprising one of a film and sheet of preformed shim material"** to the sub-structure, (2) **"curing the shim material"**, (3) **"machining the cured shim material"** and only then (4) **"assembling an outer layer with the sub-structure."**

## VI. ISSUES

Whether claims 1, 2 and 8-12 are anticipated by Thomas (U.S. Patent 3,609,116).

Whether claims 3 and 4 are obvious under 35 USC §103 over Thomas.

Whether claims 5 and 6 are obvious under 35 USC §103 over Thomas in view of applicant's admitted prior art.

## VII. GROUPING OF CLAIMS

The rejected claims stand or fall together based upon the patentability of independent claim 1.

## VIII. ARGUMENT

### 1. Discussion of the References

**Thomas (U.S. Patent 3,609,116)** teaches a moldable shim material, similar to a caulking compound which can be injected into structural gaps or applied prior to the mating of parts. It also may be pressed or calendered into strips and applied in strip form prior to mating of the parts. The material is considered a structural member after curing and may be machined, drilled or riveted. These are characteristics of the material and not the method of use of the material.

The method of use disclosed in Thomas is that of a conventional shim material, i.e. injecting or placing the shim material in the uncured state between the parts being fitted together, fitting them together and then curing the shim material in place. In other words the method is "positioning", "curing", "assembling" and, if needed, "machining." There appears to be no disclosure in any part of the Thomas reference of positioning the shim material on a structure, curing the shim material and then machining the cured shim material, all prior to assembling an outer layer on the sub-structure.

**Applicant's Admitted Prior Art (AAPA)** is as discussed on page 2, lines 3-7, where a liquid adhesive material is cured on a sub-structure and then machined to a desired thickness before assembly of the parts. The difficulties and problems associated with this known prior art method of assembly are the

problems of the difficulty of handling the viscous liquid adhesive, the containing of the liquid adhesive after application by special tooling which must be coated with a mold release agent and which must be carefully cleaned after each use.

## **2. Discussion of the Rejections**

Claims 1, 2 and 8-12 stand rejected under 35 USC §102 as being anticipated by Thomas. With respect to claim 1, the Examiner contends that the sequence of appellants' claimed steps is taught by the Thomas reference. While appellants believe that some of the steps are taught in the Thomas reference but the claimed sequence of steps is not.

Claims 3 and 4 stand rejected as obvious under 35 USC §103 over the Thomas reference. The Examiner admits Thomas "fails to teach curing the shim material by exposure of the shim material to ultra violet light or radio frequency radiation." The Examiner, however, takes the position that the manner of curing does not provide any patentable significance.

Claims 5 and 6 stand rejected under 35 USC §103 as unpatentable over Thomas in view of Applicant's admitted prior art. The Examiner admits that Thomas fails to teach "(1) machining the shim material to a desired thickness based on the measured thickness of the mating parts, and (2) machining the shim material to different thicknesses at different locations on the sub-structure so that the parts conform to a desired profile."

### **3. The Errors in the Final Rejection**

There are at least three significant errors in the Final Rejection and they are summarized as follows:

- (a) Thomas teaches away from curing and machining steps prior to assembly;
- (b) AAPA doesn't teach film or sheet of shim material; and
- (c) No suggestion to combine Thomas and AAPA.

**(a) Thomas teaches away from curing and machining steps prior to assembly**

Thomas teaches the conventional use of shim material, "its salient use being as a cast-in-place moldable shim material." Col. 8, ln 4-5. This material is placed upon one structure, the other structure placed on top and the excess material is extruded out of the edges of contact of the two structures. The material is then cured in place and the excess material machined away. Because of this teaching, Thomas actually teaches the sequence of positioning, assembly, curing and then machining steps and therefore "teaches away" from appellants' invention.

Appellants' invention specifically recites the steps of (1) positioning the shim material, (2) curing the shim material, (3) machining the shim material, and only then is appellants' last claimed step, (4) assembling an outer layer with the machined shim material substantially between the outer layer and the sub-structure,

performed. It is noted that the Examiner's detailed analysis of the Thomas reference omits any disclosure of the sequence of steps recited in appellants' claim.

Rather than point to any teaching which might disclose Appellants claimed method, the Examiner points to characteristics of the Thomas disclosure and speculates that "the shim material **may be applied** to the sub-structure prior to mating of the parts, and **may be machined.**" (Office Action, page 3, lines 4-5 - emphasis added). Such speculation is not permitted and indeed 35 USC §102, as well as §103, require that there be some specific disclosure in at least one prior art reference in order to support a rejection under §102 and/or §103.

Thomas clearly fails to support the sequence of steps, i.e. positioning, curing and machining, all occurring prior to the final step of "assembling." Thomas by itself or in combination with the AAPA does not disclose appellants' claimed invention.

**(b) AAPA doesn't teach film or sheet of shim material**

Appellants' AAPA teaches a liquid adhesive which can be cured and then machined to a desired thickness. However, the disadvantages of such liquid adhesives is also well documented in the specification as being a problem with the AAPA, i.e. must be carefully hand applied, health and safety implications associated with use, requires highly trained personnel, requires special tooling to

prevent contamination of other areas, requires tooling to be coated with release agent and thoroughly cleaned after use, etc.

Appellants have come up with a solution to the above problem in an inventive process which utilizes the best features of both the Thomas and the AAPA. Appellants' method uses the film or sheet of shim material, but in a manner contrary to that disclosed in the Thomas reference. The material is placed on the sub-structure and cured in place. It is then machined and only after that machining step is the outer layer assembled onto the sub-structure.

Thus, the problems associated with the AAPA and its use of a liquid adhesive are overcome, no special tooling is required, or the highly skilled and labor intensive steps of applying the adhesive. As a result, the present invention is a substantial improvement over the AAPA and utilizes a sequence of steps which is the direct opposite of that suggested and taught in the Thomas reference. Accordingly, the AAPA does not teach appellants' claimed invention and thus it cannot anticipate or render obvious appellants' claims.

**(c) No suggestion to combine Thomas and AAPA**

The Examiner admits that various features of appellants' claims 3, 4, 5 and 6 are not shown or disclosed in the Thomas reference. However, the Examiner suggests that these features are obvious in some fashion (not otherwise disclosed with reference to claims 3 and 4) or obvious in view of AAPA (with reference to

claims 5 and 6). If the method steps of claims 3 and 4 are not shown or disclosed in Thomas as admitted by the Examiner, they cannot be obvious in view of no other cited reference. Therefore, the rejection of claims 3 and 4 is respectfully traversed.

Even if applicant's admitted prior art taught the missing step of claims 5 and 6, the burden is on the Examiner to establish how or why it would be obvious to combine the Thomas and AAPA. As noted above, Thomas clearly "teaches away" from the sequence of steps set out in appellants' independent claim 1 and all other claims are dependent from claim 1.

The burden is on the Examiner to establish how or why one of ordinary skill in the art would be motivated to disregard the teachings of Thomas, leading one of ordinary skill in the art away from appellants' claimed combination of steps and instead combine the features of "strips and applied in strip form" from Thomas to the AAPA teaching. The burden is on the Examiner to establish some motivation for such combination and for such picking and choosing of structures or method steps from the prior art. These burdens have not been met by the Examiner.

The Court of Appeals for the Federal Circuit has consistently held, for example, *In re Rouffet*, 47 USPQ2d 1453, 1457-8 (Fed. Cir. 1998) that

"to prevent the use of hindsight based on the invention to defeat patentability of the invention, this court **requires** the examiner to show a motivation to combine the references that create the case of obviousness. In other words, **the Examiner must show reasons**

that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination in the manner claimed." (Emphasis added).

In this regard, the Examiner has provided no motivation for combining the Thomas reference with the AAPA, nor has he indicated how or why one of ordinary skill in the art would disregard the teachings in the Thomas reference to position the shim material, assemble the outer layer and then cure and machine the shim material, rather than appellants' claim combination which is to position shim material, cure the shim material, machine the shim material and then assemble the outer layer.

Inasmuch as the burden is on the Examiner, he has failed to meet the burden of establishing a *prima facie* case of obviousness with respect to claims 3, 4, 5 and 6, and therefore any further rejection under is respectfully traversed.

#### IX. CONCLUSION

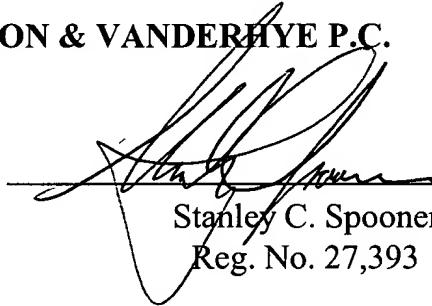
Appellants' claim recites a sequence of (1) positioning shim material, (2) curing shim material, (3) machining shim material and (4) assembling the structure. The Thomas reference teaches (1) positioning shim material, (4) assembling the outer layer, (2) curing the shim material and (3) machining the shim material, which "teaches away" from appellants' claimed sequence of steps. The AAPA teaches the use of a liquid adhesive and the well-known problems associated with such use. The failure to provide any reason for disregarding the

Thomas teaches when combining with AAPA obviates the basis for rejection. The failure to meet the Patent Office burden of establishing a *prima facie* case of anticipation and/or obviousness renders improper the currently pending rejections.

Thus, and in view of the above, the rejection of claims 1-6 and 8-12 over the cited prior art is clearly in error and reversal thereof by this Honorable Board is respectfully requested.

Respectfully submitted,

**NIXON & VANDERHYE P.C.**

By: 

Stanley C. Spooner  
Reg. No. 27,393

SCS:kmm  
Enclosures  
Appendix A – Claims on Appeal

**APPENDIX A**

**Claims on Appeal**

1. *(Amended)* A method of assembling a structure comprising at least the steps of:
  - providing a sub-structure,
  - positioning shim material on at least part of the sub-structure, said shim material comprising one of a film and sheet of preformed shim material,
  - curing the shim material disposed on the sub-structure,
  - machining the cured shim material to a desired thickness, and
  - assembling an outer layer with the sub-structure such that the machined shim material lies substantially between the outer layer and the sub-structure.
2. A method as claimed in claim 1 wherein the shim material is cured at below 80°C.
3. A method as claimed in claim 1 wherein the curing is effected by exposure of the shim material to ultra violet light.
4. A method as claimed in claim 1 wherein the curing is effected by exposure of the shim material to radio frequency radiation.

5. A method as claimed in claim 1 wherein the outer layer comprises at least two parts and the thickness of each outer layer part is measured prior to machining the shim material.

6. A method as claimed in claim 5 wherein the shim material is machined to different thicknesses at different locations on the sub-structure so that, when assembled to the sub-structure, the outer layer parts together conform, within pre-determined tolerances, to a pre-determined profile.

8. A method as claimed in claim 1 wherein the film or sheet of shim material is pre-cut into a shape suitable for direct use in a particular application prior to the shim material being positioned on the sub-structure.

9. A method as claimed in claim 1 wherein the film or sheet of shim material has a thickness in the range 0.4 to 4.0 mm.

10. A method as claimed in claim 1 wherein the shim material is positioned on a vertical surface of the sub-structure.

11. A method as claimed in claim 1 wherein the shim material is positioned on the underside of the sub-structure.

12. A method as claimed in claim 1 wherein the shim material substantially does not flow during curing at temperatures of up to 80°C.